

Patent Claims

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a)*
1. A method for exciting and determining a luminescence in an analyte sample which is located in contact with the waveguiding layer of an optical layer waveguide, wherein the luminescence is generated by non-evanescent excitation in the volume of the analyte sample, and the luminescence radiation generated in the immediate proximity of the surface of the waveguiding layer is conducted to the measuring device and determined after penetrating said waveguiding layer.
  2. The method as claimed in claim 1, wherein luminescence radiation is generated electrically, chemically or by optical excitation of radiation.
  3. The method as claimed in claim 1, wherein use is made as layer waveguide of a planar waveguide with outcoupling elements for the luminescence light.
  4. The method as claimed in claim 1, wherein use is made of a sensor platform which has a one- or two-dimensional arrangement of at least two waveguides with diffractive outcoupling elements.
  5. The method as claimed in claim 4, wherein the sensor platform is covered with a second layer which contains cutouts for holding an analyte sample in the region of the guided luminescence light.
  6. The method as claimed in claim 3, wherein the layer waveguide contains one or more diffractive elements for coupling out the luminescence radiation, and the analyte sample is arranged upstream of or between a plurality of outcoupling elements.
  7. The method as claimed in claim 2, wherein the excitation radiation of the optical excitation of radiation is directed onto the analyte sample from the opposite side of the waveguiding layer by a planar waveguide.
  8. A device for measuring luminescence generated in an analyte sample by excitation radiation, comprising
    - a) an optical layer waveguide with a transparent substrate and a waveguiding layer;
    - b) an analyte sample which is located in contact with the waveguiding layer;
    - c) an electric or optical energy source which is arranged such that the electrodes of the electric energy source are located in direct contact with the analyte sample, or the excitation radiation of the optical energy source is directed directly onto the analyte sample at an inclined or right angle, or a reservoir containing a chemical which excites a chemiluminescence in contact with the analyte sample; and
    - d) an optoelectronic detection unit for measuring the luminescence radiation generated by the action of an electric field or excitation radiation.

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9. The device as claimed in claim 8, wherein the waveguides a) are planar waveguides which have at least one outcoupling element for coupling out luminescence radiation.
10. A sensor platform composed of a planar optical layer waveguide, comprising a transparent substrate and a waveguiding layer, the waveguide having at least an outcoupling element for coupling out excitation radiation, and on whose waveguiding layer there is located a further tightly sealing layer, which has, at least in a subregion of the excitation radiation, a cutout open at the top, or a cutout which is closed at the top and connected via an inflow channel and outflow channel, for an analytical sample whose depth corresponds at least to the depth of penetration of the evanescent field of the luminescence light guided in the waveguide, and the layer consists of a material which, at least on the bearing surface at least in the depth of penetration of the evanescent field of the luminescence light guided in the waveguide, is transparent to this luminescence light, and the outcoupling element or the outcoupling elements being completely covered by the material of the layer at least in the outcoupling region of the luminescence radiation.